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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,461	06/05/2001	Wataru Matsumoto	2611-0148P	5258

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EXAMINER

ENG, MARSHALL S

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 12/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/857,461

Applicant(s)

MATSUMOTO ET AL.

Examiner

Marshall S Eng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 6-11, 13 is/are rejected.
- 7) ☒ Claim(s) 1, 2, 5, 9, 11, 12 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other: ____

DETAILED ACTION

Priority

1.1 Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on October 29, 1999. It is noted, however, that applicant has not filed a certified copy of the JP 11-308750 application as required by 35 U.S.C. 119(b).

Note that although the application is a 35 USC 371 national stage entry and does not require a certified copy of the foreign application, it does require the filing of a copy of the certified copy of the foreign priority documents.

Oath/Declaration

2.1 The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

a) The declaration should refer to the PCT International Application (JP00 07312) under which the current application is filed as the 35 U.S.C. 371 national stage entry of.

b) Further, the declaration claims priority under 35 U.S.C 119 to Japanese foreign application 11-308750. This priority claim, however, is not made in the specifications and a copy of the foreign priority document has not been submitted.

c) Still further, the declaration and the PCT International Application (JP00 07312) do not have matching inventive entities. PCT JP00 07312 lists Wataru

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Matsumoto and Hiroaki Sakai as the inventive entity whereas the currently filed declaration lists Wataru Matsumoto and Yoshikuni Miyata as the inventive entity. 37

CFR 1.497 paragraph d states that:

- (d) If the oath or declaration filed pursuant to 35 U.S.C. 371(c)(4) and this section names an inventive entity different from the inventive entity set forth in the international application, or if a change to the inventive entity has been effected under PCT Rule 92^{bis} subsequent to the execution of any oath or declaration which was filed in the application under PCT Rule 4.17(iv) or this section and the inventive entity thus changed is different from the inventive entity identified in any such oath or declaration, applicant must submit:
- (1) A statement from each person being added as an inventor and from each person being deleted as an inventor that any error in inventorship in the international application occurred without deceptive intention on his or her part;
 - (2) The processing fee set forth in § 1.17(i), and
 - (3) If an assignment has been executed by any of the original named inventors, the written consent of the assignee (see § 3.73(b) of this chapter), and
 - (4) Any new oath or declaration required by paragraph (f) of this section.

Drawings

3.1 Figures 8 and 9 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

3.2 The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: reference 25 of Figure 6, as mentioned on, for example, line 14 of page 24.

3.3 The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the Reed Solomon

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encoders and decoders of Claims 3, 6, 8, 10 and 13 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4.1 The disclosure is objected to because of the following informalities: the word "denote" on line 24 of page 2 and line 19 of page 16 and all other occurrences, where appropriate, should be "denotes."

4.2 The disclosure is objected to because of the following informalities: the subscript in the function equation $L_a(U_k)$ on page 5 is apparently incorrect. Since this function is supposed to represent the time of the first decoding process it is clear that the subscript "k" should be a 0 or a 1 depending on which is considered the base time.

4.3 The disclosure is objected to because of the following informalities: a reference to Figure 1 should be made on line 25 of page 7 or lines 1-2 of page 8 to indicate that Figure 1 is the figure that is being described.

4.4 The disclosure is objected to because of the following informalities: it is unclear, why a turbo encoder would require a deinterleaver, as stated, for example, on lines 11-13 of page 9 and on lines 19-21 of page 10. Usually, the interleaver is part of the encoder and a deinterleaver is part of the decoder.

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4.5 The disclosure is objected to because of the following informalities: it is unclear where the reference 25, listed on, for example, line 13 of page 9 and line 21 of page 10, belongs (with respect to which the referenced deinterleaver belongs in).

4.6 The disclosure is objected to because of the following informalities: the word "encoder" on line 17 of page 15 should be "decoder."

4.7 The disclosure is objected to because of the following informalities: the reference "2" in line 24 of page 16 should be "1."

4.8 The disclosure is objected to because of the following informalities: the reference to a Figure is made on line 24 of page 17 without actually listing which figure is being reference. A figure number(s) following the word "Figures" is required.

4.9 The disclosure is objected to because of the following informalities: the word "ORDERRING" is misspelled on line 7 of page 19.

4.10 The disclosure is objected to because of the following informalities: the word converter is spelled two different ways. On line 4 of page 19, it is spelled converter, but on line 5 of the same page, it is spelled convertor. While both are correct variations of the word, the use of consistent spelling is suggested.

4.11 The disclosure is objected to because of the following informalities: the word "to" should be added between the words "corresponding (to) the" on line 16 of page 24.

4.12 The disclosure is objected to because of the following informalities: the word "di" in the phrase "di-interleaver" on line 25 of page 24 and line 21 on page 25 should be "de."

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4.13 The disclosure is objected to because of the following informalities: the first occurrence of the word "made" on line 11 of page 34 should be the word "device" so the phrase can read "the communication **device** is made applicable."

4.14 The disclosure is objected to because of the following informalities: the word "achieve" at the end of line 13 of page 35 should be "achieves."

Appropriate corrections are required.

Claim Objections

5.1 Claims 1, 9, and 11 are objected to because of the following informalities: the claims list information within brackets and therefore not given patentable weight.

Appropriate correction is required.

Double Patenting

6.1 The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6.2 Claims 1, 4, 7, 9, and 11 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,507,621 (hereinafter '621).

As per claim 1 and 11,

Although the conflicting claims are not identical, they are not patentably distinct from each other because '621 substantially teaches of a communication device that uses turbo codes as error correcting codes that comprises a turbo encoder, first and second decoding units, first and second estimating/judging units and computing/error correction unit. '621 teaches of a turbo encoder that encodes the lower bits (specifically lower two bits) of transmission data to output information bits and first and second redundant bits that have been convolutionally encoded with the second redundant bits being encoded after being subjected to an interleave process, see column 15, claim 1, lines 10-18. Further, '621 teaches of first and second decoding units that extract information bits and first/second redundant bits from a received signal and calculates soft-judgment information (see probability information of estimated information of '621) by using results of the extraction and soft-judgment (probability information) that has been given as preliminary information, see column 15, claim 1, lines 19-32. '621 further teaches of first and second judging/estimating units with the first unit estimating the original (lower) information bit(s) based upon the soft-judgment (probability information) of the first and second decoder after repeatedly executing the soft-judgment (probability information) by the first and second decoders, see column 15, claim 1, lines 31-36. '621 further teaches that the second judging/estimating unit makes hard-judgments on the other (upper) bits of the received signal so as to estimate the original bits, see column 15, claim 1, lines 45-50. '621 further teaches of a unit that carries out error checking (by

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using an error correction code) on the received, estimated information bits, see column 15, claim 1, lines 37-45.

'621 does not explicitly teach of using a predetermined number of the lower bits of the transmission to encode. '621 does, however, teach specifically of using the lower two bits of the transmission to encode.

It would have been obvious to one skilled in the art at the time the invention was made to expand '621's teachings so as to be able to use more than (or less than) the lower two bits of the transmission to encode. One skilled in the art would have been motivated to use more (or less) than the two bits disclosed by '621 because it would have been obvious choice to use two bits lower bits. '621 simply discloses the lower bits, of which two bits is a subset (obviously since '621 uses bits, thereby implying more than one bit). Further, the explicit reasons behind why the lower two bits are used during encoding are disclosed in '621 in column 9, lines 19-40. These same exact reasons for why the lower two bits are used are also disclosed in the applicant's specifications. The Examiner sees no explanation or reasoning in the disclosure of why more (or less) than two bits are encoded and therefore does not see the two inventions as being patentably distinct.

As per claim 4,

Although the conflicting claims are not identical, they are not patentably distinct from each other because '621 substantially teaches of a communication device that uses turbo codes as error correcting codes that comprises a turbo encoder, and computing/error correction unit. '621 teaches of a turbo encoder that encodes the lower

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bits (specifically lower two bits) of transmission data to output information bits and first and second redundant bits that have been convolutionally encoded with the second redundant bits being encoded after being subjected to an interleave process, see column 15, claim 1, lines 10-18. '621 further teaches of a unit that carries out error checking (by using an error correction code) on the received, estimated information bits, see column 15, claim 1, lines 37-45.

'621 does not explicitly teach of using a predetermined number of the lower bits of the transmission to encode or of the information bits and redundant bits being output as a result of the encoding process. '621 does, however, teach specifically of using the lower two bits of the transmission to encode.

It would have been obvious to one skilled in the art at the time the invention was made to expand '621's teachings so as to be able to use more than (or less than) the lower two bits of the transmission to encode. One skilled in the art would have been motivated to use more (or less) than the two bits disclosed by '621 because it would have been obvious choice to use two bits lower bits. '621 simply discloses the lower bits, of which two bits is a subset (obviously since '621 uses bits, thereby implying more than one bit). Further, the explicit reasons behind why the lower two bits are used during encoding are disclosed in '621 in column 9, lines 19-40. These same exact reasons for why the lower two bits are used are also disclosed in the applicant's specifications. The Examiner sees no explanation or reasoning in the disclosure of why more (or less) than two bits are encoded and therefore does not see the two inventions as being patentably distinct.

Still further, it is obvious that the turbo encoding unit will output the encoded data once it has finished encoding it so as to have the data sent or transmitted to the decoder/receiving station. Clearly, the purpose of encoding data is to help ensure reliable transmission, which would mean that the data would necessarily be outputted from the encoder to some transmitting device.

As per claim 7,

Although the conflicting claims are not identical, they are not patentably distinct from each other because '621 substantially teaches of a communication device that uses turbo codes as error correcting codes that comprises a turbo encoder, and computing/error correction unit. '621 teaches of a turbo encoder that encodes the lower bits (specifically lower two bits) of transmission data to output information bits and first and second redundant bits that have been convolutionally encoded with the second redundant bits being encoded after being subjected to an interleave process, see column 15, claim 1, lines 10-18. '621 further teaches of a unit that carries out error checking (by using an error correction code) on the received, estimated information bits, see column 15, claim 1, lines 37-45.

'621 does not explicitly teach of using a predetermined number of the lower bits of the transmission to encode or of the non-encoded bits being output during the encoding process. '621 does, however, teach specifically of using the lower two bits of the transmission to encode.

It would have been obvious to one skilled in the art at the time the invention was made to expand '621's teachings so as to be able to use more than (or less than) the

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lower two bits of the transmission to encode. One skilled in the art would have been motivated to use more (or less) than the two bits disclosed by '621 because it would have been obvious choice to use two bits lower bits. '621 simply discloses the lower bits, of which two bits is a subset (obviously since '621 uses bits, thereby implying more than one bit). Further, the explicit reasons behind why the lower two bits are used during encoding are disclosed in '621 in column 9, lines 19-40. These same exact reasons for why the lower two bits are used are also disclosed in the applicant's specifications. The Examiner sees no explanation or reasoning in the disclosure of why more (or less) than two bits are encoded and therefore does not see the two inventions as being patentably distinct.

Still further, it is obvious that the turbo encoding unit will output the non-encoded data once it has finished encoding the lower bits so as to have the entire data packet/signal sent or transmitted to the decoder/receiving station. One skilled in the art would want the data to be outputted together so as to not have to combine the higher bits with the lower bits and the redundant bits at a later stage. By combining all of the bits together in the encoder, one skilled in the art would reduce the number of steps/stages that would be required to successfully assemble and transmit the packet/transmission data.

As per claim 9,

Although the conflicting claims are not identical, they are not patentably distinct from each other because '621 substantially teaches of a communication device that uses turbo codes as error correcting codes that comprises a first and second decoding

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units and first and second estimating/judging units. '621 teaches of a turbo encoder that encodes the lower bits (specifically lower two bits) of transmission data to output information bits and first and second redundant bits that have been convolutionally encoded with the second redundant bits being encoded after being subjected to an interleave process, see column 15, claim 1, lines 10-18. Further, '621 teaches of first and second decoding units that extract information bits and first/second redundant bits from a received signal and calculates soft-judgment information (see probability information of estimated information of '621) by using results of the extraction and soft-judgment (probability information) that has been given as preliminary information, see column 15, claim 1, lines 19-32. '621 further teaches that the second decoding unit also calculates the soft-judgment (probability information) by using the soft-judgments results of the first decoder and informs the first decoder of the results as preliminary information, see column 15, claim 1, lines 25-32. '621 further teaches of first and second judging/estimating units with the first unit estimating the original (lower) information bit(s) based upon the soft-judgment (probability information) of the first and second decoder after repeatedly executing the soft-judgment (probability information) by the first and second decoders, see column 15, claim 1, lines 31-36. '621 further teaches that the second judging/estimating unit makes hard-judgments on the other (upper) bits of the received signal so as to estimate the original bits, see column 15, claim 1, lines 45-50. '621 further teaches of a unit that carries out error checking (by using an error correction code) on the received, estimated information bits, see column 15, claim 1, lines 37-45.

'621 does not explicitly teach of using a predetermined number of the lower bits of the transmission to encode. '621 does, however, teach specifically of using the lower two bits of the transmission to encode.

It would have been obvious to one skilled in the art at the time the invention was made to expand '621's teachings so as to be able to use more than (or less than) the lower two bits of the transmission to encode. One skilled in the art would have been motivated to use more (or less) than the two bits disclosed by '621 because it would have been obvious choice to use two bits lower bits. '621 simply discloses the lower bits, of which two bits is a subset (obviously since '621 uses bits, thereby implying more than one bit). Further, the explicit reasons behind why the lower two bits are used during encoding are disclosed in '621 in column 9, lines 19-40. These same exact reasons for why the lower two bits are used are also disclosed in the applicant's specifications. The Examiner sees no explanation or reasoning in the disclosure of why more (or less) than two bits are encoded and therefore does not see the two inventions as being patentably distinct.

6.3 Claims 3, 6, 8, 10, and 13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,507,621 (hereinafter '621) in view of "On the application of turbo codes to the robust transmission of compressed images," He et al. (hereinafter He).

'621, as taught above in claims 1, 4, 7, 9, and 11, substantially teaches of the limitations of claims 3, 6, 8, 10, and 13.

'621 does not explicitly teach of using Reed Solomon codes and turbo codes with the turbo encoding occurring after Reed Solomon encoding and then turbo decoding before Reed Solomon decoding.

He, in an analogous art, teaches of using Reed Solomon code as an outer code in addition to Turbo coding, see page 559, column 1, lines 18-19.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the teachings of He to use Reed Solomon encoding as an outer code in addition to Turbo coding. One skilled in the art would have been motivated to implement the Reed Solomon outer code from the suggestion of He which states that the use of a Reed-Solomon outer code in addition to Turbo decoding results in further improvement in the transmission of data, see page 559, column 1, abstract.

Allowable Subject Matter

7.1 Claims 2, 5, and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8.1 The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Berrou U.S. Patent No. 5,446,747

This reference teaches of turbo encoders

b. Jaffe et al. U.S. Publication No. US 2002/0067779 A1

This reference teaches of the use of an inverse-interleaver (de-interleaver) after the encoding of interleaved data.

c. Valenti, M.C. "Inserting Turbo Code Technology into the DVB Satellite broadcasting system"

This reference teaches of using RS codes as an outer code with turbo codes.

d. Lee et al. "TCM, TTM, BICM, and iterative BICM assisted OFDM-based digital video broadcasting to mobile receivers"

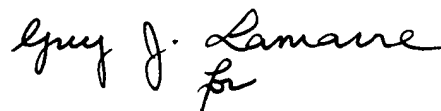
This reference teaches of using RS codes as an outer code with turbo codes.

8.2 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marshall S Eng whose telephone number is (703) 305-4638. The examiner can normally be reached on M-F, 9:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is (703) ~~305-3748~~ 872-9306. *Q*

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

mse



Albert DeCady
Primary Examiner